

SIZE BENEFICIATION OF LUNAR REGOLITH VIA TRIBOELECTRIC CHARGING FOR IN SITU RE-SOURCE UTILIZATION. D. P. Carter¹ and C. M. Hartzell¹, ¹Department of Aerospace Engineering, University of Maryland, College Park, Maryland 20742, USA

Granular mixtures containing dielectric materials are susceptible to accumulating electric charge when physically agitated due to the triboelectric effect, whereby charge is transferred between grains during contact. Lunar regolith is composed of a variety of dielectric components which are known to exhibit this behavior, and contains high-energy electrons deposited by the solar wind that may additionally contribute to charge separation through tribocharging. When a mixture of grains is agitated, grains accumulate varying levels of charge based on their size and chemical composition. An accurate predictive model for the resulting relative charge magnitude and polarity of various regolith components after inducing tribocharging could be used to selectively extract specific materials or size components from a regolith sample *in situ*. However, triboelectric charging of dielectric grains is currently poorly understood. We have updated an analytical predictive model for tribocharging of a mixture of dielectric grains and have designed and built an experimental apparatus to test the triboelectric charging predicted by this model. We will present the design of our experiment and proposed *in situ* regolith beneficiation device, as well as the initial data collected for a test mixture composed of silica-zirconia beads.